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# Changes in the Southern Gulf of St. Lawrence Cod Fishery

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FOR MORE THAN a century cod have been fished in open water months in the southern Gulf of St. Lawrence. Baited hooks and jiggers were used almost entirely until the introduction of otter trawling in 1947 produced a major change. New European fishing on the same stocks in winter brought about further changes. These developments in fishing practices were reflected in important effects on sizes and amounts of cod landed from the Gulf since 1947.

## MIGRATORY STOCK

Tagging experiments have shown that southern Gulf cod migrate during the year but the annual pattern of movement is fairly constant. During the summer they move out over the western half of the southern Gulf. Late fall finds the larger fish disappearing from this area and moving towards Cape Breton. During the winter these larger fish are concentrated in the Cape Breton area along the Laurentian Channel and in the spring they disperse to the west again.

Fishing fleets take advantage of these winter and summer concentrations. In the summer the fishery in the south-western Gulf is wholly Canadian but, in the winter, the take from the stock concentrated off Cape Breton is mainly European (Fig. 1).

## CHANGES IN LANDINGS

Until 1952 landings fluctuated from about 60 to 120 million pounds per year (Fig. 2). When the Europeans started otter trawling on this stock, landings quickly jumped to peaks of about 220 million pounds in 1956 and 1959. Since then, landings seem to be levelling off around 150 million pounds annually. European vessels are still taking about a third of this.

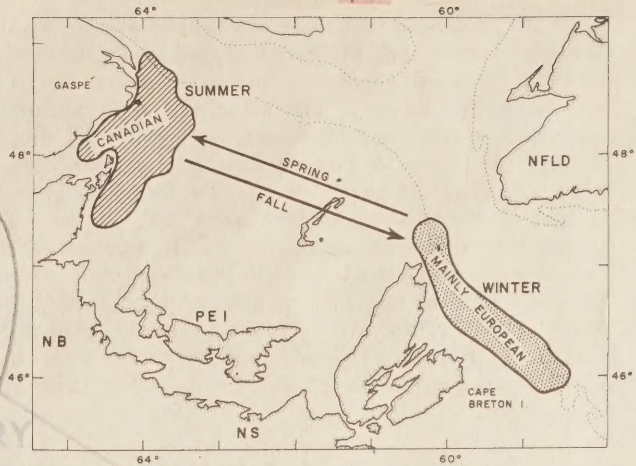


Fig. 1. Migratory cod stock in the southern Gulf of St. Lawrence.

Cod Landed by all Countries from Southern Gulf of St. Lawrence Stock

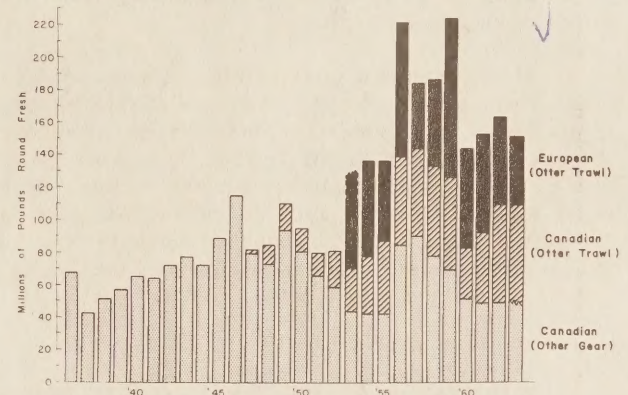


Fig. 2. Southern Gulf cod landings.

Gulf Cod Landings Gloucester Druggers

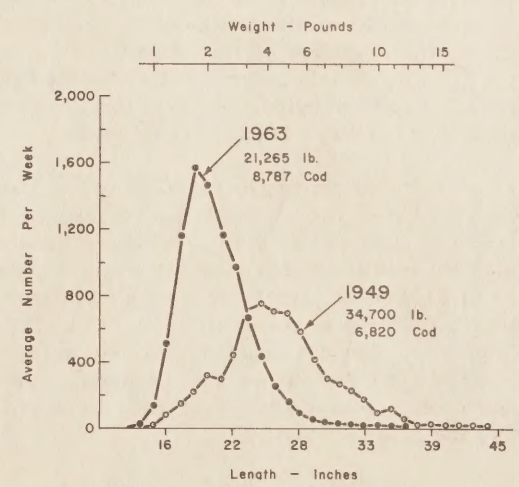


Fig. 3. Size changes in Gulf cod.



As fishing practices changed and as annual landings increased, the sizes of cod landed decreased (Fig. 3). Differences between 1949 and 1963 can be seen in the figure. The information is shown in terms of an average landing for a week's fishing by a northern New Brunswick Gloucester - class dragger (about 45 gross tons). In 1949 a greater weight of cod was landed per week (34,700 lb). The graph shows them to be bigger fish and relatively few of them were needed to make up the landing weight. In 1963 the average weekly landing was down to 21,265 pounds. This was made up of more individual fish (8,787, by count, compared with 6,820) and they averaged much smaller in weight and length.

The decrease in size of cod landed reflects two things: (1) Fish over 28 inches in length are scarce in the Gulf. (2) Processing plants can use fish around 16 inches long and a little over a pound in weight. This has affected Gulf cod fishermen. They used to discard many small cod. Now they throw away very few of the cod that they catch with the  $4\frac{1}{2}$ -inch codend mesh.

Also fishermen usually expend more effort to catch a paying trip of cod. Evidence of this is shown in statistics for Gloucester-class draggers kept over the past 15 years (Fig. 4). In 1948 their average cod catch per week was almost 40,000 pounds. Since then, this has dropped and in recent years it has fluctuated around 20,000 pounds. Since 1950, other species, such as flounders, have been making up a quarter to a third of the catch of these boats.

#### THE FUTURE

In forecasting the future of the fishery several factors are taken into account. Water temperature and circulation affect the number of young cod hatched in an annual brood, and also affect the availability of adult fish to the fishermen. Growth of the adult fish is affected by food supply as well as by water temperature. Death rates from fishing and natural causes after the fish have entered the fishery determine the number of fish surviving to grow large. Field and laboratory studies by the Fisheries Research Board provide the basis for predicting the course of the fishery from year to year.

It looks as though the Gulf of St. Lawrence fishery will remain a small-cod fishery as long as the amount of fishing remains at the present high level. Fluctuations in catch will reflect changes in sizes of broods of surviving young cod entering the fishery and in the concentration of fish schools in the summer. The late summer survey in 1964 showed a large 1961 brood on the grounds. These fish should influence landings from the summer fishery during the next two years.

Increased landings by Canadian fishermen will depend on fishing the population on its winter as well as its summer grounds. Results of survey catches

Catch per Week for Gloucester Class Draggers  
Gulf of St. Lawrence

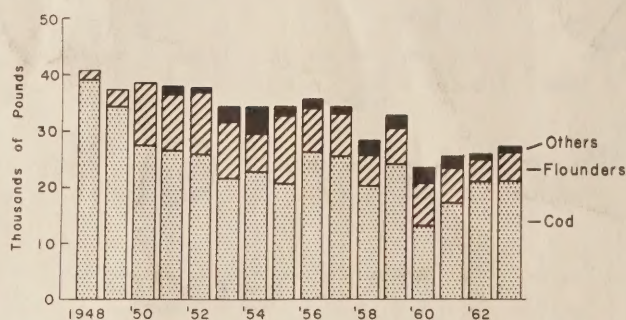


Fig. 4. Effort and landings -- Gulf cod.

#### Cod Surveys - 1964

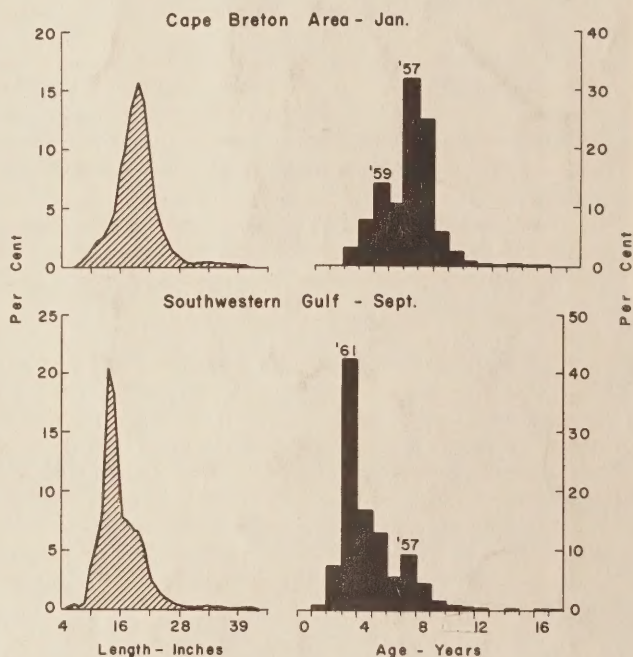


Fig. 5. Southern Gulf cod caught by research vessel.

of cod from the southern Gulf population in the winter and late summer of 1964 are of interest here (Fig. 5). The part of the population found in the Cape Breton area in the wintertime (shown in the top of the figure) is composed of larger and older fish than those found in the western part of the Gulf in the late summer (bottom part of the figure). Canadians would gain by taking a larger share of these fish when they are in the Cape Breton area being exploited by European fishermen. ✓